

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—The average pressure distribution for December, 1931, showed an elongated region of low barometer stretching in upper latitudes from the American coast far into the Bering Sea, with centers near St. Paul Island and in the Gulf of Alaska. At Dutch Harbor, near the usual center of action of the Aleutian Low, the average pressure of 29.72 inches was almost two-tenths of an inch higher than that at St. Paul, which is a very unusual condition. In the Gulf of Alaska the Low was maintained rather vigorously from the 13th until the close of the month and, because, for much of that period, it extended far southward, average pressures along the American coast were well below the normal almost to extreme southern California.

In consequence of the extensive cyclonic developments over the eastern part of the Pacific, the main body of the great North Pacific anticyclone was crested near midocean at about the thirtieth parallel, with a minor anticyclone prevailing for the greater part of the month west of southern and Lower California. In the Far East fewer cyclones than normal for December entered the sea from the continent, and an extensive bank of high pressure for the most part overlay eastern Asia and, in lesser degree, the Japanese Archipelago. The principal cyclones of the western waters of the Pacific seem to have originated over the Kuro Siwo Current.

The following table gives barometric data for several island and coast stations in west longitudes, including Point Barrow on the Arctic Ocean.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure, at sea level, North Pacific Ocean and adjacent waters, December, 1931, at selected stations

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Point Barrow ¹	29.87	-0.16	30.56	31st.	29.26	22d. ³
Dutch Harbor ¹	29.72	+0.16	30.34	6th.	29.00	1st.
St. Paul ¹	29.53	-0.05	30.40	14th.	28.86	7th.
Kodiak ¹	29.51	-0.05	30.20	10th.	28.88	17th.
Midway Island ¹	30.18	+0.17	30.42	20th.	29.76	12th.
Honolulu ⁴	30.01	0.00	30.24	20th.	29.70	12th.
Juneau ⁴	29.60	-0.19	30.14	10th.	28.67	16th.
Tatoosh Island ⁴	29.78	-0.18	30.42	5th.	29.06	23d.
San Francisco ⁴	30.04	-0.08	30.37	16th.	29.63	28th.
San Diego ⁴	30.07	0.00	30.32	26th.	29.72	9th.

¹ P. m. observations in averages; a. m. and p. m. in extremes.

² For 30 days.

³ And on the 22d.

⁴ A. m. and p. m. observations.

⁵ Corrected to 24-hour mean.

Cyclones and gales.—Following hard upon the stormy weather of November, 1931, that of December was equally disturbed in northern and western waters, but far stormier off our American west coast. Here, on the 6th and 7th and from the 17th until the 29th, the coastal region was swept by intermittent gales that extended as far southward on the 23d and 27th as the latitude of San Francisco. The cyclone causing the gales of the 6th and 7th developed rather suddenly west of Vancouver Island and within a few hours had acquired its greatest intensity, with central pressure below 29.40 inches. The gales blew over the region between the coast and the one hundred and thirty-fifth meridian and for a time attained hurricane force near 46° N., 130° W.

The succeeding coastal gales occurred on the southeastern boundary region of the elongated cyclone, the central area of which lay over the Gulf of Alaska from the 13th to 31st. Coastwise steamers during this period encountered the most intense gales—of force 11 from southerly directions—on the 17th and 26th, south of North Head, Wash., and from westerly directions of similar force on the 26th west of Vancouver and near 40° N., 137° W. On the 23d and 27th whole gales (force 10) were reported off the central California coast, and fresh to strong gales over a long stretch of coast on other dates. Several vessels on the 26th were forced to heave to for hours in the violent storm.

Midway along the upper routes between the American coast and the Aleutian Islands gales were less frequent than elsewhere in the same latitudes. The greater part of the high winds occurred after the middle of the month here, but the highest reported velocity was on the 1st, when a northwest gale of force 11 was experienced near 46° N., 143° W. South of Dutch Harbor maximum forces of 11 to 12 occurred on the 22d and 28th. Between 170° W. and Japan, over a wide strip of ocean south of the fiftieth parallel stormy weather was frequent and severe. South and southwest of the western Aleutians winds of the higher forces, 11 to 12, were reported on the 2d, 18th, 29th, and 30th, in addition to those of lesser forces, 8 to 10, on many other days. The storm to hurricane forces of the 2d, 29th, and 30th were felt over a wide range of the sea.

Special mention should be made of a rather interesting disturbance which developed east of the Hawaiian Islands on the 6th. For upward of a week it remained practically stationary, its northward advance blocked by a middle-latitude anticyclone. By the 10th and 11th fresh to strong easterly gales were blowing on its north sector, in 27° to 29° N., 145° to 150° W. On the 14th, however, the HIGH gave way and the disturbance, accompanied by gales of force 8 to 9, quickly escaped to higher latitudes, where it joined with the cyclone then stretching southward from Alaskan waters.

Only one tropical disturbance of any intensity, and that of slight extent, occurred in December, 1931. This was a typhoon of the central Philippines and is described in the subjoined article by the Rev. Miguel Selga, S. J., director of the Philippine Weather Bureau.

Other moderately stormy weather in various parts of the Tropics was occasioned by strong northeast monsoons which rose to gale force on several days in the China Sea. On the 4th of the month trade winds of force 8 occurred west of the Hawaiian Islands, and on the 15th, 26th, and 27th northers of moderate gale force were experienced in the Gulf of Tehuantepec.

Winds at Honolulu.—The prevailing wind direction at Honolulu was from the east. The maximum velocity was 43 miles from the east on the 20th, during the prevalence of a very strong anticyclone to the northward.

Fog.—The occurrence of fog in December increased slightly over that of November along the northern routes, and decreased slightly in American coastal waters. Fog was reported on seven days along the length of coast between Eureka and San Diego, and on not to exceed three days in the foggiest of 5° squares in higher latitudes of the open Pacific. As a rule its occurrence was widely scattered, but on the 5th to 7th it was more evenly distributed.

THE TYPHOON OF VISAYAS, DECEMBER 5-6, 1931

By Rev. MIGUEL SELGA, S. J.

[Weather Bureau, Manila, P. I.]

The afternoon weather map of December 4, 1931, shows an area of low pressure extending over southern Visayas, Mindanao, and Palawan. The rapid drop of the barometer east of Samar early in the morning of December 5, left no doubt but that a typhoon had developed in the eastern sector of the depression and it was fast approaching Samar. Typhoon warnings were sent immediately to all the Provinces and stations likely to be affected, and, on account of the peculiar period of the milling season, to all the sugar centrals of Visayas. The typhoon moved so fast that shortly after noon of December 5, it passed south of and very close to Catbalogan, Samar, where the barometer dropped from 756.91 mm. at 8 a. m. to 734.67 mm. 18 minutes past noon. Government offices at

The typhoon was treacherous on account of the high velocity of its translation and the narrowness of its diameter. The 530 kilometers that separated Catbalogan from Culion were covered by the typhoon in 13 hours and 15 minutes, giving a velocity of 40 kilometers, or almost 25 miles, per hour.

The narrowness of the storm's diameter is evident from the fact that, * * * although the wind was very strong in the proximity of the center, yet in some places like Culion and southern Mindoro, four hours before and after the barometric minimum the wind was no more than a gentle breeze with clear or partly cloudy sky. The motor boat *Siruma* was washed ashore and completely destroyed on the eastern coast of Sibuyan and the *Virginia*, on the western coast of Busuanga. The barogram from Catbalogan, presented herewith, shows the limited extent, but steepness of gradient, of the typhoon.

BUCKET OBSERVATIONS OF SEA-SURFACE TEMPERATURES

By GILES SLOCUM

STRAITS OF FLORIDA AND CARIBBEAN SEA

Table 1 shows the average temperatures for the Caribbean Sea and the Straits of Florida for December of each year from 1919 to 1930, inclusive, and Table 2 summarizes the temperatures for December, 1930, in the same areas. The chart shows the number of observations taken in December, 1930, within each 1° square, and mean temperature data for subdivisions of the area considered.

The surface temperatures of the Straits of Florida fall rapidly during December, but the seasonal downward trend frequently is interrupted by alternations of warmer and cooler quarter-months, especially in the latter part of the month. This fluctuation of mean temperature is a winter condition, and is in contrast with the fairly steady and persistent drop of autumn. By the end of the month, the transition from autumn to winter is well advanced, and normal temperatures characteristic of winter prevail, with the water temperatures usually not far from the normal annual minimum.

During December the season has not progressed so far in the Caribbean, where autumn conditions still persist, as it has in the straits. This month is in the midst of the period of most rapid drop in normal temperature over all parts of the Caribbean Sea, where the winter season of relatively low temperatures, with little or no upward or downward trend, is delayed until late January and lasts until early March.

December, 1930, was the warmest December in the Caribbean during the term of years covered (1920-1930) and the coolest in the Straits of Florida. For this month as a whole nearly all parts of the Caribbean were unprecedently warm and all distinctly above their average temperatures for the 11-year period. The third quarter of this month was relatively the coolest, when the mean temperature of the Caribbean was a trifle below that of the same period in 1926. The other three quarters were record-breaking or record-equaling. In the Straits of Florida, only the first quarter of this month was near the seasonal average. The second, third, and fourth quarters were cooler than the hitherto coolest corresponding periods.

Current charts¹ indicate that the water flowing through the Yucatan Channel between November and January divides into three main branches. The weakest, in the

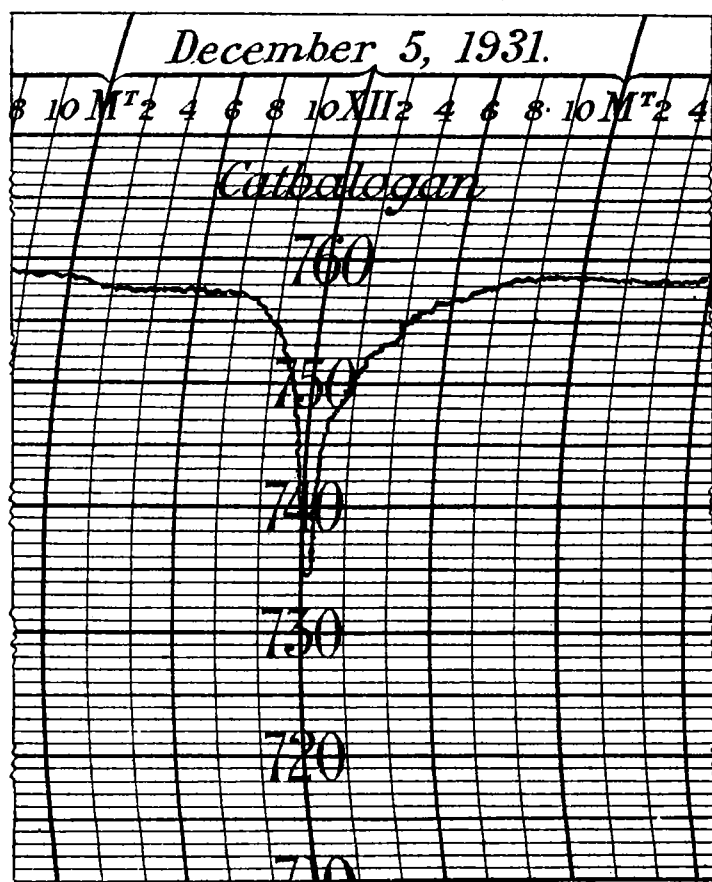


FIGURE 1.—Barogram of the typhoon of December 5, 1931, at Catbalogan, west coast of Samar

Catbalogan were closed at 11 a. m. and the employees sent home to prepare for the storm. The quick dissemination of typhoon warnings by means of the police and the town crier minimized the damages that otherwise would have taken place, yet 28 fish corrals were reported destroyed, over a hundred houses of light materials were damaged, and two persons were found drowned in the barrios of Catbalogan. Taking a west by northwest direction, the typhoon passed north of Capiz at 7 p. m. causing a barometric minimum of 744.66 mm. and southwesterly gusts of force 11. One hour and a half after midnight, the typhoon passed close to and north of the Culion Leper Colony and was located in the China Sea about 130 miles to the westward on the morning weather map of December 6.

¹ Cf. Hydrographic Office of the Navy Department of the United States. Pilot Chart of the Central American Waters. Washington, D. C. Published monthly.